

NATIONAL ROUND ROBIN - 4

TOSS-UP

1. **ERSC; Short Answer:** Identify a silica-rich, relatively light-colored intrusive rock composed primarily of potassium feldspar, quartz, sodium plagioclase, homblende, and mica?

ANSWER: GRANITE

BONUS

1. **ERSC; Multiple Choice:** Which of the following land forms is not associated with glacial erosion?

(W) Cirques
(X) Kames
(Y) Fiords
(Z) Homs

ANSWER: X-- KAMES

TOSS-UP

2. **BIOL; Multiple Choice:** The hormones that cause the tissues of an embryo to develop male reproductive organs are

(W) androgens.
(X) estrogens.
(Y) FSH.
(Z) LH.

ANSWER: W-- ANDROGENS

BONUS

2. **BIOL; Multiple Choice:** During early development, human male and female embryos are identical in appearance for the first

(W) six weeks.
(X) eight weeks.
(Y) three months.
(Z) five months.

ANSWER: W-- SIX WEEKS

TOSS-UP

3. COMP; Multiple Choice: Encapsulation is

- (W) a form of abstraction.
- (X) information hiding.
- (Y) combining data and behavior.
- (Z) none of the above

ANSWER: X-- INFORMATION HIDING

BONUS

3. COMP; Multiple Choice: In a relational database

- (W) all information is represented as values in a table.
- (X) logical aspects are separated from physical aspects.
- (Y) NULL values are always valid datatypes.
- (Z) all of the above

ANSWER: Z-- ALL OF THE ABOVE

TOSS-UP

4. PHYS; Multiple Choice: The person who first realized that an electric current produces a magnetic field was

- (W) Hans Oersted.
- (X) Albert Einstein.
- (Y) Michael Faraday.
- (Z) William Gilbert.

ANSWER: W-- HANS OERSTED

BONUS

4. PHYS; Multiple Choice: The Earth's magnetic south pole is located in

- (W) Alaska.
- (X) Australia.
- (Y) Russia.
- (Z) Canada.

ANSWER: Z-- CANADA

TOSS-UP

5. **GENR; Multiple Choice:** Halving a musical note's amplitude

(W) halves its frequency.
(X) decreases its loudness.
(Y) doubles its speed.
(Z) halves its wavelength.

ANSWER: X-- DECREASES ITS LOUDNESS

BONUS

5. **GENR; Short Answer:** What is the name for the process for making hydrocarbon oils from coal, lignite, or natural gas, which was first used in Germany?

ANSWER: FISHER-TROPSCH (PROCESS)

TOSS-UP

6. **CHEM; Multiple Choice:** Aldehydes or ketones that contain numerous hydroxyl groups are called

(W) proteins.
(X) carbohydrates.
(Y) nucleic acids.
(Z) lipids.

ANSWER: X-- CARBOHYDRATES

BONUS

6. **CHEM; Multiple Choice:** Which of the following is not a class of lipids?

(W) waxes
(X) steroids
(Y) fats
(Z) amino acids

ANSWER: Z-- AMINO ACIDS

TOSS-UP

7. **ASTR; Multiple Choice:** Our understanding of the universe has been advanced greatly by Newtonian mechanics, relativity theories and quantum mechanics. A more recent development involves the rules of mechanics that deal with unstable systems called

(W) gravitational theory.
(X) chaos theory.
(Y) time motion theory.
(Z) Lorentz contractions.

ANSWER: X-- CHAOS THEORY

BONUS

7. **ASTR; Multiple Choice:** A telescope's magnifying power is defined by

(W) focal length of eye piece times the focal length of the objective.
(X) focal length of the eye piece divided by the length of the objective.
(Y) focal length of the objective times the focal length of the eye piece.
(Z) focal length of the objective divided by the focal length of the eye piece.

ANSWER: Z-- FOCAL LENGTH OF THE OBJECTIVE DIVIDED BY THE FOCAL LENGTH OF THE EYE PIECE

TOSS-UP

8. **BIOL; Multiple Choice:** Before it is released from the ovary, the ovum does not

(W) become diploid.
(X) receive nutrients.
(Y) become larger.
(Z) undergo meiosis.

ANSWER: W-- BECOME DIPLOID

BONUS

8. **BIOL; Multiple Choice:** The head of a sperm contains a small cap that contains the enzyme vital to

(W) more sperm production.
(X) its mobility.
(Y) fertilization.
(Z) its development.

ANSWER: Y-- FERTILIZATION

TOSS-UP

- 9. MATH; Multiple Choice:** A system for the representation of a point in space in terms of its distance, measured along a set of mutually perpendicular axes is called

(W) Cartesian coordinates.
(X) Polar coordinates.
(Y) Cassini coordinates.
(Z) Weissmann coordinates.

ANSWER: W-- CARTESIAN COORDINATES

BONUS

- 9. MATH; Short Answer:** A part of a solid, such as a cone or pyramid, lying between the base and a plane parallel to the base, which intersects with the solid, is called a

ANSWER: FRUSTUM

TOSS-UP

- 10. PHYS; Multiple Choice:** A rectifier is a

(W) triode.
(X) diode.
(Y) semiconductor.
(Z) transistor.

ANSWER: X-- DIODE

BONUS

- 10. PHYS; Multiple Choice:** Which of the following does not correctly describe a diode?

(W) It consists of a filament and a plate
(X) It is a type of glass vacuum tube
(Y) There is a flow of electrons in it
(Z) It is filled with argon gas

ANSWER: Z-- IT IS FILLED WITH ARGON GAS

TOSS-UP

11. CHEM; Multiple Choice: An example of a polysaccharide is

- (W) glycogen.
- (X) pentose.
- (Y) glucose.
- (Z) sucrose.

ANSWER: W— GLYCOGEN

BONUS

11. CHEM; Multiple Choice: The unfolding of a protein by heat or extreme pH is called

- (W) hydrogenation.
- (X) denaturation.
- (Y) dehydrogenation.
- (Z) hydration.

ANSWER: X—DENATURATION

TOSS-UP

12. COMP; Multiple Choice: Which of the following is NOT true of a binary search tree?

- (W) A binary tree has a finite set of vertices
- (X) Each vertex of a binary tree is either empty or is the root of two disjoint binary subtrees
- (Y) A binary tree has an infinite set of vertices
- (Z) the binary subtrees of a vertex are called the left and right subtrees

ANSWER: Y— A BINARY TREE HAS AN INFINITE SET OF VERTICES

BONUS

12. COMP; Multiple Choice: In a binary search tree, at each node NI with key KI

- (W) the keys to the left of NI are half of the keys to the right of NI.
- (X) all the keys in the right subtree of NI are less than KI, and all keys in the left subtree of node NI are greater than KI.
- (Y) all the keys in the left subtree of NI are less than KI, and all keys in the right subtree of node NI are greater than KI.
- (Z) all the keys below node NI have the value KI.

ANSWER: Y— ALL THE KEYS IN THE LEFT SUBTREE OF NI ARE LESS THAN KI AND ALL THE KEYS IN THE RIGHT SUBTREE OF NODE NI ARE GREATER THAN KI

TOSS-UP

13. BIOL; Multiple Choice: Not all viruses

- (W) are enclosed in a membrane.
- (X) have a protein coat.
- (Y) are noncellular.
- (Z) contain DNA or RNA.

ANSWER: W-- ARE ENCLOSED IN A MEMBRANE

BONUS

13. BIOL; Multiple Choice: Botulism attacks the

- (W) digestive system.
- (X) reproductive system.
- (Y) respiratory system.
- (Z) nervous system.

ANSWER: Z-- NERVOUS SYSTEM

TOSS-UP

14. ASTR; Multiple Choice: The plasma flowing from the sun due to the solar wind meets the earth's electrical fields in the

- (W) troposphere.
- (X) ionosphere.
- (Y) magnetosphere.
- (Z) stratosphere.

ANSWER: Y-- MAGNETOSPHERE

BONUS

14. ASTR; Multiple Choice: The Sun's corona is

- (W) hotter than the Sun's visible surface.
- (X) cooler than the Sun's visible surface.
- (Y) in thermal equilibrium with the Sun's photosphere.
- (Z) in thermal equilibrium with the Sun's Chromosphere.

ANSWER: W-- HOTTER THAN THE SUN'S VISIBLE SURFACE

TOSS-UP

15. PHYS; Multiple Choice: Semiconductors

- (W) are better electrical conductors than metals.
- (X) are much larger than vacuum tubes.
- (Y) must be replaced more frequently than vacuum tubes.
- (Z) do not give off as much heat as vacuum tubes.

ANSWER: Z-- DO NOT GIVE OFF AS MUCH HEAT AS VACUUM TUBES

BONUS

15. PHYS; Multiple Choice: Semiconductors

- (W) may behave like diodes.
- (X) are insulators.
- (Y) transmit electric current in two directions.
- (Z) do not have many advantages over vacuum tubes.

ANSWER: W-- MAY BEHAVE LIKE DIODES

TOSS-UP

16. CHEM; Multiple Choice: Carbohydrates that cannot be broken down into smaller units are called

- (W) starches.
- (X) monosaccharides.
- (Y) polysaccharides.
- (Z) disaccharides.

ANSWER: X-- MONOSACCHARIDES

BONUS

16. CHEM; Multiple Choice: Which of the following vitamins is water-soluble?

- (W) vitamin A
- (X) vitamin C
- (Y) vitamin D
- (Z) vitamin E

ANSWER: X-- VITAMIN C

TOSS-UP

17. **ERSC; Short Answer:** Identify a fine grained extrusive rock derived from a low-silica melt that is rich in iron and magnetism?

ANSWER: BASALT

BONUS

17. **ERSC; Multiple Choice:** Of the following glacial deposits, which would exhibit the poorest aquifer properties?

(W) Drumlins
(X) Eskers
(Y) Plains
(Z) Kames

ANSWER: W-- DRUMLINS

TOSS-UP

18. **GENR; Multiple Choice:** Which of the following is responsible for the changing of the seasons in North America?

(W) The Earth's axis is not perpendicular to the ecliptic
(X) The Earth's orbit is elliptical
(Y) The Earth's axis precesses
(Z) The Sun moves through space

ANSWER: W-- THE EARTH'S AXIS IS NOT PERPENDICULAR TO THE ECLIPTIC

BONUS

18. **GENR; Multiple Choice:** Which of the following best explains why a sailboat can sail into the wind?

(W) Archimedes' Principle
(X) Bernoulli's Law
(Y) Pascal's Law
(Z) Reynold's Numbers

ANSWER: X-- BERNOULLI'S LAW

TOSS-UP

19. PHYS; Multiple Choice: Selective doping of a silicon chip

(W) forms the connections between diodes and transistors.

(X) causes certain areas to become diodes while other areas become transistors.

(Y) allows it to be connected to other electrical devices.

(Z) makes it extremely long-lasting.

ANSWER: X-- CAUSES CERTAIN AREAS TO BE DIODES WHILE OTHER AREAS BECOME TRANSISTORS

BONUS

19. PHYS; Multiple Choice: Integrated circuits

(W) are used as amplifiers and switches.

(X) do not need connections between their diodes and transistors.

(Y) only contain a small number of diodes and transistors.

(Z) have only limited usefulness.

ANSWER: W-- ARE USED AS AMPLIFIERS AND SWITCHES

TOSS-UP

20. BIOL; Multiple Choice: According to the viral theory of cancer, normal cells are transformed into cancerous cells by

(W) malignant viruses.

(X) benign viruses.

(Y) viral protein coats.

(Z) oncogenes.

ANSWER: Z-- ONCOGENES

BONUS

20. BIOL; Multiple Choice: Robert Koch did each of the following except

(W) discover the cause of tuberculosis.

(X) discover the cause of anthrax.

(Y) help to identify the carrier of bubonic plague.

(Z) help develop the germ theory of infectious disease.

ANSWER: Y-- HELP TO IDENTIFY THE CARRIER OF BUBONIC PLAGUE

TOSS-UP

- 21. CHEM; Short Answer: The amount of heat needed to raise the temperature of one gram of a substance is called**

ANSWER: SPECIFIC HEAT

BONUS

- 21. CHEM; Multiple Choice: Cholesterol is an example of**

(W) a wax.
(X) a fat.
(Y) an oil.
(Z) a steroid.

ANSWER: Z-- A STEROID

TOSS-UP

- 22. PHYS; Short Answer: A material that glows when struck by electrons is said to be**

ANSWER: FLUORESCENT

BONUS

- 22. PHYS; Multiple Choice: Which of the following does a radio transmitter not do?**

(W) Change sound into electromagnetic waves
(X) Send amplified signals to an antenna
(Y) Change radio waves into sound waves
(Z) Send out radio signals that have specific frequencies

ANSWER: Y-- CHANGE RADIO WAVES INTO SOUND WAVES

TOSS-UP

- 23 MATH; Short Answer: What is the next term in the Fibonacci sequence whose last three terms were -- 34, 55, 89**

ANSWER: 144

BONUS

- 23 MATH; Multiple Choice: A set of linearly independent vectors that spans a vector space is called a**

**(W) subspace
(X) eigenvector
(Y) group
(Z) basis**

ANSWER: Z-- BASIS

TOSS-UP

- 24 BIOL; Short Answer: One characteristic of all algae is that they contain**

ANSWER: CHLOROPHYLL

BONUS

- 24 BIOL; Multiple Choice: The cluster of cells that forms in the blastocyst produces three cell layers during**

**(W) gastrulation.
(X) implantation.
(Y) cleavage.
(Z) double fertilization.**

ANSWER: W-- GASTRULATION

TOSS-UP

- 25. CHEM; Short Answer: How many electrons are shared between carbon atoms in the compound ethanol?**

ANSWER: 2

BONUS

- 25. CHEM; Multiple Choice: Originally, the term reduction meant**

- (W) removal of electrons.**
- (X) addition of electrons.**
- (Y) reaction with oxygen.**
- (Z) removal of oxygen.**

ANSWER: Z-- REMOVAL OF OXYGEN